

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of

Boeing Commercial Airplane Group

for an exemption from §§ 25.785(h)(2),
25.807(d)(7), 25.813(e), 25.853(d) of Title
14, Code of Federal Regulations

Regulatory Docket No. FAA-2001-9458

GRANT OF EXEMPTION

By letter B-H340-01-3172, dated May 7, 2001, Mr. K. E. Kaulia, Manager, Airplane Certification, Deliveries and Fleet Support, Single Aisle Platform, PO Box 3707, Seattle, Washington, 98124-2207, petitioned for an exemption from the requirements of §§ 25.785(h)(2), 25.807(d)(7), 25.813(e) and 25.853(d) of Title 14, Code of Federal Regulations (14 CFR). This exemption, if granted would permit flight attendant seats that do not provide direct view, a distance greater than sixty feet between passenger exits, installation of interior doors between passenger compartments, and interior materials that do not comply with heat release and smoke emissions requirements on a Boeing 737-800 airplane, with certain limitations.

The petitioner requests additional relief from the following regulations:

Section 25.785(h)(2) - Requires that flight attendant seats be located to provide a direct view of the passenger cabin.

Section 25.807(d)(7) - Limits the distance between passenger emergency exits to sixty feet.

Section 25.813(e) - Prohibits installation of interior doors in between passenger compartments.

Section 25.853(d) - Limits maximum heat release rates and smoke emissions for large panel cabin interior materials.

The petitioner's supportive information is as follows:

This petition for exemption from 14 CFR 11.25, from certain parts of Federal Aviation Regulations governing the design of Transport Category Airplanes (TCA) when the airplane is not operated for hire, or for common carriage. This petition is specifically proposed for the Boeing Model 737-800 (BBJ2) Airplane when it is configured for “private use” and not operated for hire, or for common carriage.

“General Background

“Under Production Certificate 700 and Type Certificate A16WE, Boeing is required to manufacture the BBJ2 in accordance with 14 CFR part 25. Part 25 provides rules governing the design and the certification requirements of TCA that are generally considered to be commercial aircraft being operated under [14 CFR] Part 121 in the commerce of transporting fare paying passengers. There are however, other types of businesses that TCA supports that do not use their airplanes in revenue service. Operations such as these are ‘Private, not-for-hire.’ The business, or private, types of interior configurations of these airplanes differ substantially from the rows of seats on an airliner. Boeing believes that certain part 25 rules intended for an airliner configuration are inconsistent with the business, or private, types of interiors. Most of the BBJ2s intended for business, or private, operations will be operated under 14 CFR parts 91 or 125. Boeing is requesting an exemption from certain requirements of part 25 for those BBJ2 airplanes that will be operated under parts 91 or 125 and not operated for hire, or for common carriage.

“TCAs intended for private use, have the following common features that encourage special consideration for unique certification requirements.

“1. Operation is limited to private use by an individual, a company, or public entity and does not include a public passenger, or cargo, for-hire commercial service.

“2. In most cases the passenger configuration of the airplane is less than 30% of that of a traditional commercial airline configuration, (and in the case of wide-body airplanes, may be less than 20% of the maximum certified capacity).

“3. The interior arrangement is static, allowing flight and cabin crews to be familiar with the particular configuration of the airplane, emergency equipment provided, and the location and operation of the emergency exits. A commercial airline may use many different types of airplanes with many different interior configurations and many different interior configurations on a single airplane type.

“4. Owner preference and requirements for custom features such as layout, materials, fabrics, fixtures, and finishes is a major driving force behind the marketability of these types of airplanes.

“5. One-of-a-kind interior configurations include the use of many different types of materials and compartments such as boardrooms, bedrooms, lavatories, and lounges rather than traditional airline type seating arrangements.

“This petition requests that the FAA grant exemptions to the Model 737-800 airplane for the following provisions of 14 CFR part 25 when the airplane is not operated for hire, or for common carriage.

“SECTION 25.785(h)(2) View of the Cabin by a Seated Attendant

“Exemption Requested

“That the Boeing Model 737-800, when configured for private use and not operated for hire, or for common carriage, be exempted from that part of 14 CFR part 25.785(h)(2) which requires ‘Direct view of the cabin area for which the flight attendant is responsible.’

“Justification

“The requirements of 14 CFR part 25.785(h)(2) were incorporated into the FARs [Federal Aviation Regulations] through amendment 25-51 and the amendment was part of the Airworthiness Review Program. Of the comments submitted to the FAA during the NPRM [Notice of Proposed Rulemaking] comment period, two commented that, if galley doors were used as emergency exits, the placement of an attendant seat near the exit, as required in proposed § 25.785(h), could preclude compliance with the requirement that the attendant be provided a direct view of the cabin area. To cover this situation, it was suggested that the requirement be conditioned to apply insofar as practicable and without compromising the proximity to required floor level exits. The FAA concurred and further stated in the preamble to the final rule that ‘location of the flight attendant seats near the floor level exits in this case is more important than the requirement that the flight attendant have a direct view of the cabin.’ The final rule was revised from the NPRM proposal to address this relative importance. As galleys located near floor level exits are an essential part of the operation and interior configuration of a commercial airplane in revenue service, so too are partitions and interior walls, essential to the successful operation and interior configuration of a business airplane. These features may interfere with the flight attendants direct view.

“Passenger Safety Considerations

“Considering the smaller number of occupants in the business, private airplane, usually less than 30% of that of a traditional commercial configuration, and the familiarity of the flight and cabin crews with the specific airplane, its passengers and its interior arrangement, and the wording of the existing rule that places the emphasis for safety on the proximity of the exit to the attendant over the ability of the attendant to view the cabin area, there should be no degradation in the passenger safety as a result of this requested exemption. It is worthwhile to note that if the BBJ2 is restricted to 19

passengers, under Part 91, no flight attendant would be required and therefore no direct view requirement would be in effect.

“SECTION 25.807(d)(7) Establishing a 60-Foot Minimum Distance Between Adjacent Emergency Exits.

“Exemption Requested:

“That the Boeing Model 737-800 be exempted from part 25.807(d)(7) when the airplane is not operated for hire, or for common carriage. Concern over distance between exits arises from managing an evacuation, of a commercial airliner, when the passengers queue in the aisles becomes excessive due to long distances between exits. Because of the reduced number of occupants on the subject airplane, the passengers queue will be much shorter. Boeing is requesting an exemption from the 60-foot rule. Boeing believes that there are sufficient numbers of exits in close proximity of each other and fewer passengers to evacuate.

“Justification

“Amendment 25-67 established the maximum longitudinal distance between adjacent emergency exits on the same side of the fuselage at 60 feet in order to ensure an opportunity for safe, rapid evacuation of the airplane in the event of an emergency. The concerns that generated this rule are as follows:

“The rate at which passengers flow through an emergency exit appears to be a major factor in limiting the rate of passenger evacuation from an airplane.

“The restriction in the flow of evacuees at the emergency exit causes a backup of passengers in the longitudinal aisles of the airplane.

“At the onset of an emergency evacuation, as the passengers leave their seats and enter the longitudinal aisles leading toward the exits, these aisles fill with passengers extending from the approach-way along the longitudinal aisles to a natural ‘split-line’ between adjacent emergency exits where passengers, without external motivation, will turn toward the exit they feel is closest.

“A critical element in a successful emergency evacuation where all possible passengers have an opportunity for safe, rapid evacuation from the airplane, is for the cabin attendant to be at the exits to manage those passengers that are coming toward the exits to ensure that the available exits are ‘loaded’ as uniformly as possible. This management of the passengers within the cabin is conducted so as to have the last passenger on the ground at any one exit occur at approximately the same moment as the last person reaches the ground from each of the other exits.

“As exit separation becomes greater, and the number of passengers entering the aisles between adjacent exits becomes greater, the task of successfully managing the evacuation becomes more difficult.

“The preamble to this amendment states that the regulation was issued as an interim action until ‘better knowledge permitting development of a specific performance standard becomes available.’

“There are two factors that exist for the BBJ2 justifying an exemption from Part 25.807(d)(7).

“It is reasonable to assume that some interior arrangements will cover, and make inaccessible, the over-wing emergency exits. In this case, unlike an airliner, the interior arrangement can be created in support of owner/operators requirements and, at the same time, the seating can be arranged to optimize egress to the fore and aft Type I exits.

“Due to the small numbers of passengers the airplane will carry, the adverse effect of these passengers on the ability of the flight attendant to carry out a rapid and safe evacuation from the airplane in the case of an emergency, will be minimized. The maximum number of passengers aboard the airplane will be fifty, and, in most cases, the knowledge of the airplane and its emergency systems, by these passengers, will be greater than passengers on board an airliner. Typical passengers will usually be associates of the owner, will fly the same airplane many times, and will have the opportunities to discuss the operation of the airplane with the crew who usually are on a first name basis with the passengers.

“As stated above, when the separation of exits along the fuselage becomes greater, the task of managing a successful evacuation becomes greater. This increase in difficulty is a function of the number of passengers that fill the aisles of the airplane at the onset of the evacuation. The best overall criterion, for any exit arrangement, is that the exits be adequate in number and in compliance with the rules. They should be uniformly distributed along the length of the fuselage with exits located near the front and the rear of the fuselage. Given a maximum number of thirty four passengers, the BBJ2 with one pair of floor level exits located at the forward end of the cabin, and a second pair of floor level exits at the aft end of the cabin satisfies that general criteria.

“Passenger Safety Considerations

“In FAA Exemption No. 6820A, the FAA noted that the ‘FAA had previously approved interior arrangements for mixed cargo/passenger airplanes incorporating a single pair of Type I exits for up to 34 passengers.’ This would indicate that the maximum passenger capacity of the BBJ2, with only fore/aft Type I exits is 34 passengers. The FAA believes that passenger capacity limitations are appropriate when exit distances exceed 60 feet. The standard 737-800 comes equipped with two overwing exits (OWES) on each side of the fuselage. The presence of 4 OWES increases passenger safety by decreasing the distances between exits to a distance compliant with Part 25.807(d)(7). However, many business, private, configurations include fixed monuments that would cover one or more of the OWES. The FAA has identified these arrangements as requiring special consideration. Given that the BBJ2 can have as many as 4 emergency exits and as few as 2 on each side of the fuselage, it seems reasonable that any exemption to Part 25.807(d)(7) would have to maintain reasonable proximity of passengers to exits. To maintain this proximity, Boeing recommends that the FAA review this exemption request with all 4 OWES deactivated and with 2 OWES on one side deactivated.

“With all 4 OWES deactivated the interior configuration should be designed so that each passenger seat are (sic) distributed in the forward and aft portions of the cabin so as to be within 30 feet of an emergency exit. In order not to overload any one Type I exit no more than 34 seats shall be located within 30 feet of either pair of Type I emergency exits.

“With 2 OWES on one side deactivated the interior configuration should be designed so that each passenger seat are (sic) located within 60 feet of an emergency exit on the side of the airplane in which the was deactivated and within 30 feet of an exit on the opposite side of the airplane.

“SECTION 25.813(e) Prohibiting internal cabin doors in emergency access routes

“Exemption Requested

“That the BBJ2, be exempted from the rule addressing doors between passenger seating areas. When this rule was promulgated private, business categories were not considered.

“Justification

“On the BBJ2, portions of the interior cabin may be configured with privacy areas to accommodate very private meetings. The only conceivable method of providing for such privacy requirements is through the use of walls and doors within the passenger cabin. In almost any imaginable operation, the requirements for doors between different areas of the airplane are basic and intrinsic to its operation. When a privacy area is created within the passenger cabin, the doors that separate the private area from the rest of the cabin will, by definition be located ‘between passenger compartments.’

“For the case of a room covering the total width of the passenger cabin, the doors at the front of the compartment and at the aft end of the compartment would be doors latched open during taxi, takeoff and landing. This would be the requirement whether the compartment is occupied or not. The latch system would be redundant, and the door and the latching system would be designed for crash loads. This configuration allows the room to be a part of the evacuation route between different parts of the cabin.

“For the case of a compartment that does not cover the total width of the passenger cabin and passengers can access different areas of the cabin by walking around the compartment, the door to the compartment would be latched open when the compartment is occupied and latched closed when the compartment is not occupied for taxi, takeoff and landing. The latch system would be redundant and the door and the latching system would be designed for crash loads. This configuration would ensure a viable escape route for occupants of the compartment in the case of emergency, and would preclude passengers from entering the compartment inadvertently during an evacuation should the compartment be empty.

“Passenger Safety Considerations

“Considering the small number of occupants, usually less than 30% of that of a traditional commercial configuration, and the familiarity of the flight and cabin crews with the specific airplane, its passengers, its interior arrangement, and the wording of the existing rule, (Part 25.813(f), if it is necessary to pass through a doorway separating the passenger cabin from other areas to reach any required emergency exit from any passenger seat, the door must have a means to latch it in the open position. The latching means must be able to withstand the loads imposed upon it when the door is subjected to the ultimate inertia forces, relative to the surrounding structure. The door must be designed to be frangible in the closed position and resistant to the inertial forces of an accident in the open position. The FAA has determined that such doors, when installed across the main cabin aisle, open and close transversely to the longitudinal axis of the airplane. It is obvious that the escape path not be obstructed by curtains, or doors, however, insuring that the doors be latched in the appropriate direction during taxi, takeoff, and landing in order for the passengers to have an unobstructed path to the emergency exits would place the emphasis for safety on the proximity of the exit to the passenger and the ability of the passenger to view the cabin area. Therefore there would be no degradation in the level of safety by providing an exemption from the rule Part 25.813(e).

SECTION 25.853(d) Requiring That Cabin Materials Meet Specific Flammability Standards.

“Exemption Requested

“That the BBJ2, be exempted from part 25.853(d) which requires interior components and materials to meet more stringent flammability measures than was previously required under Appendix F of part 25.813.

“Justification

“At times, the owner of a private airplane will have specific needs for the use of exotic or plush, extremely comfortable materials to be used in the cabin. Usually these materials cannot satisfy the rigid flammability requirements of this paragraph. Compliance will be shown by separating out those materials of an exotic nature and complying with the earlier amendment level in those smaller quantities and show compliance to the newer amendment on the majority of the passenger compartment such as ceilings, walls, carpet, cabinets, galleys, and other seating areas.

“The purpose of this amendment was to ensure that occupants of an airplane, during an emergency that includes a cabin fire have an opportunity to evacuate the airplane before heat released by the fire or the phenomena known as ‘flash-over’ causes the environment in the cabin to reach the flash point of the ceiling material. On a BBJ2, with approximately 30 percent of the number of passengers carried in an equivalent sized airliner, an emergency evacuation of the airplane will occur at times much more representative of a smaller type of airliner. Because of the lower passenger densities, the lower passenger-to-exit ratios, and the enhanced evacuation rate capability provided by the type of exits installed in the BBJ2, it is appropriate to apply criteria to this airplane that is more closely associated with airplanes carrying twenty or fewer passengers. The passenger to door ratio will be less than those airplanes envisioned by the rule, and the emergency exits are capable of evacuating more passengers in a short period of time. As illustrated in the graphs, shown in Enclosure 1, [available in the Docket] the evacuation of the BBJ2 airplane occurs in a shorter time, before heat release becomes critical. The evacuation times shown in the graphs are based on estimated data, particularly for the BBJ2. For illustrative purposes, the heat release curve for the BBJ2 is double that for the airliner, but still the BBJ2 evacuation is complete before total heat release becomes critical. We therefore request an exemption from this rule, because the passenger will have evacuated before the environment becomes lethal, or non-survivable and the smoke could overcome the passengers.

“Passenger - Safety Considerations

“Considering the small number of occupants, usually less than 30% of that of a traditional commercial configuration, and the familiarity of the flight and cabin crews with the specific airplane, its passengers, [and] its interior arrangement there should be no degradation in passenger safety. The flammability requirements were based on evacuation of the aircraft by a larger number of passengers within 90 seconds, the smaller number of BBJ2 passengers would be able to evacuate the aircraft in less time, before the cabin became unsafe from lethal or non-survivable smoke and fumes.

“Public Interest

“Boeing's request for an exemption for the -800 is similar to the FAA Exemption No. 6820A for the Boeing Model 737-700IGW (BBJ) Airplane, and is based on the unique operation of transport category airplanes intended for private use. Such airplanes have the following common features, which encourage special consideration for certification requirements:

“1. Operation is limited to private use by an individual, a company, or a government and does not include a public passenger or cargo for-hire commercial service.

“2. In most cases the passenger configuration of the airplane is less than 30% of that of a traditional commercial airline configuration.

“3. Flight and cabin crews are intimately familiar with the particular configuration of the airplane, the interior arrangement, emergency equipment provided, and the location and operation of the emergency exits. This is as opposed to those cases possible in a commercial airline where many different types of airplanes may be in use by a single operator, and many different interior configurations of a single airplane type may be operated by a single airline.

“4. Owner preference and requirements for custom features such as layout, materials, fabrics, fixtures, and finishes is a major driving force behind the marketability of these types of airplanes.

“5. Owner desired privacy areas on the airplane dictate the use of compartments such as boardrooms, bedrooms, lavatories, and lounges rather than traditional airline type seating arrangements featuring enclosed lavatories but a wide open cabin. These features combine to create unique, one-of-a-kind interior configurations and the application of many different types of materials.

“Boeing feels that there are additional justifications for consideration of such exemptions as follows:

“6. The FAA has previously approved special features, for transport category airplanes operated in private use, Reference (2), that are similar to those addressed in this petition for exemption. The BBJ2 airplane and BBJ airplane are very similar.

“7. The intent of the requested exemption has been to reduce the FAA activities associated with repeated exemption requests and the accompanying burden of multiple and repeated findings, and to ensure consistency.

“8. Many of the passengers are intimately familiar with the particular configuration of the airplane, the interior arrangement, and the location of the emergency equipment and

emergency exits. This is as opposed to general public passengers on a commercial airliner having no familiarity with the interior arrangement or location of emergency equipment or exits.

“9. Unlike the 737-700 IGW, The 737-800 airplane has two automatic overwing exits on each side of the fuselage.

“The 737-800 is one of two basic airframe made available by Boeing for conversion/modification by various completion centers into an executive/VIP airplane, with the unique operation and/or features described above.”

A summary of the petition was published in the Federal Register on May 29, 2001 (66 FR 29202). No comments were received.

The FAA's analysis/summary is as follows:

The differences that exist between commercial and private use operation (whether by an individual or a corporation) of transport category airplanes warrant consideration of the appropriate level of safety. The FAA is giving great attention to the issues raised when these airplanes are operated in private, not-for-hire use. In recognizing the differences between commercial and private use operations, the FAA has identified several regulatory requirements, including those in this petition, that may need to be revised to address the safety issues revealed by these differences. The FAA is currently reviewing the adequacy of the current regulations and may, in the future, propose revisions to the requirements, where appropriate.

Direct View

The petitioner has identified the requirement for flight attendant seats to be located to provide a direct view of the passenger cabin as not practical for compliance with the executive type interior to be used on the 737-800. The complexity of the interior arrangement, coupled with the need to retain proximity to emergency exits is cited as the primary reason that compliance is impractical.

The FAA has considered the requirement for direct view in the context of private use airplanes, and agrees that much of the justification for the requirement is based on air carrier type operations. The practicality of locating flight attendant seats near emergency exits so that there is a direct view of occupants inside of rooms is questionable, at best. In this regard, the FAA does believe that some relief may be appropriate for airplanes intended for private use. The FAA notes that the justification for the requirement for direct view is not limited to observation of passengers that are not familiar with the interior, however. Flight attendant seats should be located so that there is a direct view provided for the cabin area that is practical. Flight attendant seats should not face away from the cabin, for example. In those areas of the airplane where traditional seating arrangements are used, the FAA believes that direct view should be provided.

In considering the need for direct view, the FAA agrees that the restricted nature of the operation of a private use airplane mitigates much of the need. That is, the operator has control of and can restrict the population of passengers, unlike an air carrier. The risk of passengers engaging in hazardous or malicious activity is essentially eliminated, and the need for direct view is limited to those cases where a passenger might need assistance. We consider that this objective is met by requiring that a majority of flight attendants seats face the cabin.

Distance Between Exits

The FAA is also considering the issue of distance between exits as part of its overall review of private use airplanes. Amendment 25-67 was adopted in order to establish quantitative limits on the distance that could exist between passenger exits, and to address what appeared to be a trend of increasing distance between exits. As noted in the petitioner's supporting information, the FAA intended that the quantitative limit could be replaced with a performance standard at some point in the future. The FAA is considering development of alternative standards for transport category airplanes operated for private use. One of the requirements that is being addressed is distance between exits. The FAA is refining its proposed alternative criteria.

As stated in the preamble to the regulation, a simple evacuation demonstration does not address the potential concerns arising from excessive distance between exits. Issues such as disruption of interior features, debris in the aisle, or failure of another exit are not addressed in evacuation demonstrations. These issues are magnified the greater the distance between exits, and are not necessarily only related to high density seating arrangements. Therefore, the outcome of the 90-second evacuation demonstration in accordance with § 25.803 of part 25 is not relevant to the disposition of the petition. Similarly, the provisions cited by the petitioner relating to exit deactivation and alternate exit configurations are limited to those particular aspects of the requirements, but do not, in any way, relieve the requirement for adjacent exits to be within sixty feet of each other.

That is, the further the exits are apart, the higher the probability that an *individual* would not be able to get from one exit area to another in an actual accident. In an evacuation demonstration, the time it takes an individual to get from one part of the cabin to another is primarily related to the number of passengers between that person and the area he or she is trying to reach. When the cabin is relatively empty, these times are very short; this may not be the case in an actual accident, where the scenario is much less predictable. Therefore, contrary to the argument put forth by the petitioner, the fact that the seating arrangement for this airplane is of low density is not, in and of itself, sufficient justification for granting an exemption.

As noted by the petitioner, there are two main differences between this airplane and a typical 737 for commercial operation. First, the airplane in question is not to be operated in commercial service. It is intended for private use, and not for carriage of persons for hire. Second, the passenger capacity permitted by the available exits will greatly exceed the actual number of seats on the airplane.

For the first consideration, the FAA acknowledges that the persons flying on the airplane will not be fare-paying passengers, and therefore might not expect an equivalent level of safety to that afforded in commercial operation. Such passengers must be afforded an adequate level of safety however, so the status of the passengers is not entirely relevant to determine whether an exemption should be granted.

Regarding the second point as noted above, the number of passengers is not the paramount concern when addressing the distance between exits, although it is relevant in determining the type and number of exits required. It is this point that the FAA has considered further in making its determination.

The FAA notes that it is only the deactivation of the type III overwing exits that necessitate an exemption from the regulations. That is, either the forward or aft pair of type I exits could be deactivated and the airplane would still be in compliance with the regulations. In that case the evacuation capability of the airplane would be diminished over what is proposed, but would be in compliance. Nonetheless, the type III exits are probably the easiest exit type to accommodate in an interior arrangement and the FAA considers that this should be the first option when designing the interior.

Interior Doors

The current regulations allow the installation of interior doors, provided that passengers can not be seated on both sides of the door during takeoff and landing. The FAA has safety concerns regarding doors that are located between passengers and exits. The FAA has proposed to prohibit such installations in future designs, as detailed in Notice of Proposed Rulemaking 96-9 (61 FR 38551, July 24, 1996). However, until the regulations are revised, such doors may continue to be installed without the need to process a petition for exemption. Additionally, the FAA has recently issued exemptions for private use airplanes that would permit installation of doors between passenger compartments, provided that certain limitations are met. The petitioner has proposed these limitations as part of this petition.

While a grant of exemption can not be said to provide the same level of safety that would be afforded were there strict compliance with the regulations, the resultant level of safety is consistent with other private use airplanes. In addition, the level of safety that results from this exemption is specifically requested and desired by that segment of the public, namely the owners, that will fly on these airplanes. The FAA also notes that no other parties have expressed an interest in this petition.

With respect to the possibility that a door will remain closed when it should not be, the FAA believes that a higher level of awareness is required to address this issue. Due to the relative complexity of the cabin interior, the FAA does not believe that inspection by flight attendants prior to takeoff and landing is sufficient to verify that interior doors are in their proper position. Consequently, some type of remote indication is considered necessary; the petitioner's proposal to provide remote indication to the flight crew is considered adequate.

With respect to the integrity of the means used to latch doors open for takeoff and landing, the FAA considers that redundant means are necessary, as proposed. Each latching means should have the capability of retaining the door in the takeoff and landing position under the inertia forces of § 25.561. In addition, the FAA believes that the door must be frangible, in the event that it is closed, or closes during an emergency landing. Frangibility may be demonstrated in accordance with the criteria set forth in Advisory Circular 25-17, paragraph 43.b(2).

After considerable deliberation, the FAA has concluded that the installation of interior doors that span the main cabin aisle can be allowed with certain limitations. In order to maximize the level of safety, the FAA will require that certain limitations be made mandatory to permit such installations. The FAA will require that the doors installed across the main cabin aisle open and close in a transverse direction. That is, the direction of motion of the door must be at a right angle to the longitudinal axis of the airplane. A “pocket door” is one example of such a design. This will tend to minimize the chance that the inertia forces of an accident could force the door closed. The FAA will also require that notification of the existence of the doors be provided to passengers who are flying on the aircraft for the first time. These conditions will assure an adequate level of safety for occupants in private aircraft operations. As noted previously, there are precedents for this decision involving other private use airplanes.

Interior Materials

With respect to the flammability of interior materials, the petitioner has accurately summarized the requirements. The petitioner correctly notes that the requirements are related to prolonging the time available for evacuation. The petitioner has also included theoretical graphical information plotting evacuation time versus material flammability for a typical commercial arrangement and the type of arrangement envisioned for the private use 737-800. [available in the Docket] These data show that the latter airplane can have greater evacuation capability and essentially not require the improved materials. The FAA notes that these graphs are hypothetical and not based on empirical data.

In promulgating the rulemaking, the FAA did incorporate a discriminant based on passenger capacity that was intended to address smaller airplanes. These smaller airplanes have a ratio of exits to passengers that is typically quite good and where the evacuation times are expected to be quite low. Under these conditions the benefits of improved materials were expected to be negligible. The airplane type discussed in the petition was not envisioned by the rulemaking insofar as the large size with low passenger count is concerned. The FAA has considered the issue of the evacuation capability of the airplane relative to the flammability of the materials, and finds that there may be some relief possible. However, the issue of flammability is not limited to post-crash scenarios, and the inflight fire threat must also be addressed. The FAA notes that the petitioner has not proposed an alternative heat release or smoke emission criteria, but rather an exemption from the requirement to assess the heat release and smoke emissions of certain materials altogether.

Since the main benefit of improved interior materials is to lengthen the time available for evacuation, an arrangement that effectively provides the same evacuation capability would satisfy much of the concerns addressed by the requirement, albeit indirectly. The FAA has reviewed the full-scale fire test data used to develop the heat release requirements, as well as considered accident data relevant to this issue. This review is not complete, but it does suggest that a quantifiable improvement in evacuation capability could warrant a relaxation of the heat release requirements.

It is also the petitioner's contention that the particular cabin configuration(s) and mode of operation of the 737-800 make it likely that the evacuation capability under actual accident conditions will more closely model the evacuation capability shown for certification demonstrations. Therefore, the FAA has determined that a 45 second evacuation time would provide for a higher level of safety than is provided on some earlier certificated airplanes, where compliance with the heat release and smoke emissions requirements is not required. There are precedents for this decision involving other private use airplanes.

The remaining issue of the in-flight fire scenario needs to be addressed as well. The major issue with respect to in-flight fires is timely recognition. On some airplanes the interior includes isolated areas that do not lend themselves to timely detection of a fire. For the purposes of this exemption an isolated passenger compartment is defined as a room that does not contain an egress path (e.g., main cabin aisle, cross aisle or passageway), or is isolated by a door. In order to address the in-flight case, the FAA believes that installation of a smoke detector in such areas would compensate for the potential for an increased in-flight fire threat. Therefore, each isolated passenger compartment must incorporate a fire detection system that meets the requirements of § 25.858. While this section is written for cargo compartment fire detection systems, the criteria contained therein are considered appropriate to this application.

Passenger Notification

Although many persons will be frequent passengers on these airplanes, some passengers will be unfamiliar with their operation and with differences with commercial passenger operations. These persons will not be aware of the specific grants of exemption, and might assume that these airplanes were effectively equivalent to airplanes used by a commercial operator. For this reason, the FAA considers that it is necessary for each passenger to be made aware that the particular airplane differs from the occupant safety standards mandated for the airplane type in general. The FAA will allow each operator to determine how best to accomplish this notification, but will require that procedures be developed whereby each passenger is so informed, prior to flying on the airplane for the first time. The notification to any individual need only be accomplished once.

While the FAA is not aware of any specific incidents of economic harm as a result of different standards being applied to different private use airplanes, the FAA acknowledges that significant upgrading of the occupant safety standards in recent years has made this a distinct possibility. Furthermore, as more airplanes are utilized in executive operation, differences in certification bases will become more significant in

terms of the burden of compliance. This issue is generally not a factor for commercial operation, because the operating rules are typically upgraded along with the type design standards, making the requirements effectively the same for all manufacturers. For privately operated airplanes, this is not the case. Thus while a grant of exemption is clearly in the interest of the segment of the public for which it is requested, the FAA agrees that the public at large has the potential to benefit by granting increased flexibility to the manufacture and modification of the 737-800.

While this grant of exemption cannot be said to provide the same level of safety that would be afforded were there strict compliance with the regulations, the resultant level of safety is consistent with other private use airplanes. For example, the majority of transport category airplanes used in private operation are not required to comply with the heat release and smoke emissions regulations, by virtue of their earlier certification bases. With respect to interior doors, if the compartments separated by doors are looked at individually, the resultant interior arrangements are typically (although not exclusively) quite similar to small private use airplanes that only require a single pair of exits.

In consideration of the foregoing, I find that a grant of exemption is in the public interest and will not adversely affect the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 U.S.C. 40113 and 44701, delegated to me by the Administrator, Boeing Commercial Airplane Group is granted an exemption from the requirements of 14 CFR § 25.785(h)(2), to allow the installation of flight attendant seats that do not provide direct view of the cabin; § 25.807(d)(7), to permit exit to exit distances of greater than sixty feet; § 25.813(e), to allow installation of interior doors between passenger compartments; and § 25.853(d), to install interior materials that do not comply with heat release and smoke emissions requirements, on the Boeing Model 737-800 airplane, is hereby granted, with the following provisions:

1. The airplane is not operated for hire, or offered for common carriage. This provision does not preclude the operator from receiving remuneration to the extent consistent with 14 CFR part 125 and 14 CFR part 91, subpart F, as applicable.
2. A majority of flight attendant seats must be oriented to face the passenger cabin.
3. Each door between passenger compartments must be frangible.
4. Each door between passenger compartments must have a means to signal to the flight crew when the door is closed. Appropriate procedures/limitations to ensure that takeoff and landing is prohibited, when any such door is not in the proper takeoff and landing configuration, must be established.
5. Each door between passenger compartments must have dual means to retain it in the open position, each of which are capable of reacting the inertia loads specified in 14 CFR § 25.561.
6. Doors installed across a longitudinal aisle must translate laterally to open and close.

7. When materials are installed that do not comply with the requirements of appendix F, parts IV and V, it must be shown that the passengers and crewmembers can be evacuated in 45 seconds or less, under the conditions described in part 25, appendix J.
8. There must be means, that meets the requirements of § 25.858(a)-(d), to signal the flightcrew in the event of a fire in any isolated passenger compartment.
9. When both pairs of overwing exits are deactivated, each passenger seat shall be located within 30 feet of an emergency exit, on each side of the airplane, and no more than 34 seats shall be located within 30 feet of either pair of Type I emergency exits.
10. When both overwing exits on one side of the fuselage are deactivated, but one or both of the overwing exits on the other side of the fuselage remain active, each passenger seat shall be located within 60 feet of an emergency exit on the side of the airplane in which the exit was deactivated and within 30 feet of an exit on the opposite side of the airplane.
11. When the airplane does not comply with the occupant safety requirements of appendix F, parts IV and V, or when doors are installed in specified egress paths, each passenger must be so informed. This notification is only required prior to the first time a person is a passenger on the airplane.
12. There must be means, that meet the requirements of § 25.858(a)-(d), to signal the flight crew in the event of a fire in any isolated passenger compartment (as defined above).

Issued in Renton, Washington, on August 17, 2001

/s/ Vi L. Lipski
Vi L. Lipski
Manager
Transport Airplane Directorate
Aircraft Certification Service